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MANUFACTURING MANAGEMENT

THE MANUFACTURING ENGINEER: AUTOMATION'S FORGOTTEN MAN

HOW GLASS REINFORCES THE VALUE OF ENGINEERING PLASTICS

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LABOR COSTS GET HAMMERED DOWN

A new era of world competition has forced U.S. manufacturers to restructure and become the low-cost producers in their markets. But little progress was made until wage policies were changed.

BY JOHN D. BAXTER

The ongoing massive restructuring of U.S. industry has proved to be more painful and protracted than anyone expected. Worse, an increasing number of corporate managers are asking: "Where's the payoff?"

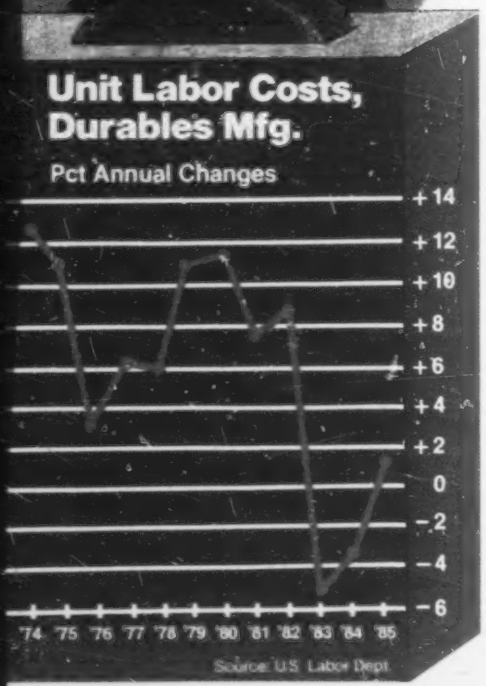
One clear sign of the depth and sweep of the restructuring was noted in a recent Congressional study. The report found that between 1974 and 1984, some 11.5 million workers lost their jobs because of plant shutdowns and relocations.

The study noted that a "large proportion" of the displaced workers were in manufacturing industries. Not surprisingly, at the storm center of the restructuring tempest has been durable goods manufacturing industries. And it's worth noting that metals and metalworking accounts for some 85 pct of that industry sector.

Payoffs to companies from all the restructuring have proved elusive. But it can be said that at least one critically important payoff has now emerged.

Factory labor costs are heading down!

For example, the most basic labor cost in manufacturing—labor cost per unit of output—for the first time in more than two decades, declined for two straight years in 1983 and 1984.



Durables Lead the Way

In the durable goods manufacturing sector, the industry group hit hardest by restructuring, the 5.1 pct decline in unit labor costs in 1983 was by far the steepest for any single year in the entire post-World War II period. And this was followed by a 3.9 pct cost decline in 1984.

There has been little cheering or media drum-beating over this remarkable labor cost decline. That is so, probably, because labor costs in durables manufacturing rose in 1985, albeit, a modest 1.7 pct. That rise is viewed by some labor economists as only a passing thing. It is seen as due chiefly to a cyclical setback in 1985 that caught many companies with rebuilt payrolls after near-boom business volume in the previous year. The U.S. economy grew at only 2.4 pct in 1985 following a year when the U.S. economy grew at the hottest pace (6.6 pct) in 30 years.

"We got caught in a trap play," said one executive. "But I think we are back on course now in putting a lid on our plant costs."

One industrial relations executive hails the turnaround in labor costs as "the best news we have had about manufacturing in this country in a very, very long time."

The 'turnaround' he sees is a 2.4 pct average yearly *decline* in unit labor costs in durables manufacturing for the years 1983-85—compared to a 6.3 pct average *rise* in the years 1974-84.

The Reasons

What, at long last, is bringing about falling unit labor costs?

Top managers in durable goods lines are running the full program of restructuring in trying to strengthen their companies. Many of their varied actions have directly or indirectly helped get labor costs under control.

But real progress didn't seem to come until companies, between 1978 and 1983, made what labor

Higher Productivity Plus Smaller Wage Hikes Equals Lower Unit Labor Costs

Key Labor Measures, Durables Manufacturing

Annual Pct Changes—1974-84 vs 1983-85

	1974-84	1983-85
Productivity	+2.3	+6.5
Compensation	+8.5	+3.8
Unit Labor Costs	+6.3	-2.4

Source: U.S. Labor Dept.

analysts at The Conference Board call a "fundamental change in wage setting policies."

The Conference Board made this point after conducting two near matching surveys (near matching in companies surveyed and in questions asked) of 500 companies, first in 1978, then again in 1983. Within those years, U.S. industry clearly made a major shift to "new patterns" of wage setting.

"Corporations have switched their wage setting policies from imitation of other companies' wage increases, toward internal criteria," noted the board following the 1983 survey. "Under growing competitive pressures, companies now base wage changes on labor cost per unit of output, and on expected profits."

In other words, it has not been simply tougher wage bargaining by management, or less labor union resistance that has produced the recent years' lower unit labor costs. The key is that management has made a fundamental change in setting wage objectives and in the way it bargains.

A Breakthrough

So, in all the restructuring by U.S. industry, it wasn't until it restructured its wage setting practices that real payoffs came in the critical area of factory unit labor costs. Certainly, in all the previous years of industry restructuring, no significant response was seen in labor costs and productivity.

The box describing comparative wage objectives (see p. 52) is based on the board's findings. It makes clear the big shift in wage setting and bargaining.

Note that in 1978, the wage setting objective that held managements' top priority was adherence to industry-wide wage patterns. Management thinking behind this was that if a company paid the same wage scale as its competitors, it was safe; it wouldn't be giving away any labor cost advantage.

Second on the priority list in the 1978 survey, was the setting of company wages according to local labor market conditions and wage rates. At the time, it was felt that this made sense. Companies could set wages at various plants to match local wage levels. Then, it wouldn't lose employees in any area because of wage disparities.

These objectives had little to do with making a company a tougher competitor—at a time when market competition was intensifying by the day. Wages were set as if companies were competing chiefly for workers; actually, the real competition was in the marketplaces.

As one labor consultant, in retrospect, said about these wage setting priorities: "Those policies came from personnel departments, not from the guys trying to keep companies afloat."

A Big Swing

In the 1983 survey management shifted its top priority to setting of wages based on "productivity and labor cost trends in the company." That, as board analysts noted, represents a major shift in management priorities in wage setting objectives.

In the 1983 survey, "expected company profits" rose to second place. Thus, the new top wage policy priorities are aimed directly at a company's own labor cost, productivity and profit situation.

Also, that the top choice in wage setting policy in 1978—industry-wide patterns—came in a poor fourth in the 1983 survey.

Said one analyst, "Since 1983, management thinking in wage setting has been essentially, 'to heck with what the rest of my industry is doing. I have to make sure this particular company survives and prospers. My labor cost and productivity problems are unique. I must deal singularly with them, and not allow industry-wide standards to dictate them.' "

It is considered more than coincidence that since U.S. industry—chiefly durable goods producers—made the major shift to new wage policies, there has also been a major favorable shift in both labor costs and productivity.

The table here on *Key Labor Measures—Durables Manufacturing*—makes very clear the favorable shifts on corporate labor factors. In 1974-84, labor productivity rose at an average annual rate of 2.3 pct, compared to 6.3 pct in 1983-85. In 1974-84, worker pay rose by 8.5 pct a year, compared to 3.8 pct in 1983-85. In 1974-84, unit labor costs *rose* an average 6.3 pct a year, compared to a 2.4 pct *decline* in 1983-85.

Other Forces

It is true that many diverse corporate management policies, other than just wage policies, helped produce these gains on the plant labor front. Also, the growth rate of the economy was stronger in 1983-85. Progress can be made against just about any business problem when times are good.

Some observers give the lion's share of the credit for recent improved labor cost/productivity performance to the cooling of inflation.

There's no denying that inflation accounted for much of the sharp rise in labor costs during the peak inflation years of 1978-81. But it was also a poor productivity showing that hurt badly. After all, any wage is tolerable if productivity is great enough to absorb it. In 1978-81, however, productivity wasn't up to doing that. Output per hour of all persons in durable manufacturing in those years rose a weak average of

Wage Objectives—How Companies Have Shifted Priorities, 1983 vs 1978

Ranked in Order of Priority of More Than 500 Companies

1983	1978
1. Productivity or labor cost trends in this company	1. Industry-wide wage patterns
2. Expected profits of this company	2. Local labor market conditions and wage rates
3. Local labor market conditions and wage rates	3. Expected profits of this company
4. Industry-wide wage patterns	4. Productivity or labor cost trends in this company
5. Consumer price index increases	5. Consumer price index increases
6. Past wage patterns of this company	6. Influence of this wage settlement on others
7. Influence of this wage settlement on others	7. Potential losses from a strike
8. Past benefit patterns of this company	8. Past wage patterns of this company
9. Potential losses from a strike	9. Past benefit patterns of this company
10. National labor market conditions and wage rates	10. Major union settlements in other industries
11. Major union settlements in other industries	11. National labor market conditions and wage rates

Source: The Conference Board

1.2 pct a year. In the 1983-85 period, following the shift to new wage policies, productivity rose an average 6.3 pct a year. Inflation can be one factor; labor costs another.

It was not inflation, but rather the cooling of inflation that spurred management to restructure wage setting policies. Companies could no longer hide their high labor costs and low productivity by simply hiking prices on their products.

One factor that has helped make the new corporate wage policies so effective has been their timing. As the Conference Board surveys show, managers started to make the great swing to the new policies between 1978 and 1983. The timing for the new policies was, in a sense, forced on management by greatly intensified competitive marketplace pressures, much of it foreign in origin.

A case in point: The U.S. trade balance in manufactured goods showed a $20 billion *surplus* as late as 1975. By 1984, this surplus had turned to a $78 billion *deficit*.

The new wage policies, designed to get production costs down and restore competitiveness, went into action at the same time the economy was being choked by back-to-back recessions in 1980-81. These recessions led, in 1982-83, to the highest unemployment rates in more than 30 years.

Thus the new wage policies found weakened worker resistance. "Concession bargaining" made its first appearance. Swiftly, the new wage policies became set, and they quickly exerted great leverage on labor costs and productivity.

Here to Stay?

Does the new direction in wage setting have staying power? Will it lapse back to traditional pattern bargaining, or back off from giving top priority to production costs?

Predictably, in time, there will be serious challenges to the new wage setting thrust. Pattern bargaining, for example, gave unions a lot of clout. They could "gang up" on major industries. Other settlements at other companies would fall in line like dominoes.

Nobody can answer the question on a possible union challenge. But, the recent concessionary attitude of labor on wage hikes suggests there will be little or no challenge. Major collective bargaining contracts settled in U.S. industry during 1985 hiked wages by an average 2.3 pct for the first year of contracts. The U.S. Labor Dept. said that was the smallest increase for any year since the department started keeping such records in 1968.

Recently, several labor consultants and economists predicted that 1986 will be the fifth straight year that U.S. workers will get receive smaller pay increases than the previous year.

The new U.S. wage policies are designed to help get production costs down and productivity up at individual companies. And that seems precisely what companies most need in the new world economy. That points to staying power for the new approaches to wage setting.

In fact, some economists say competition is worsening and that even now a worldwide "glut economy" exists. They see excess capacity for just about any manufactured product that can be named. Survival seems assured for only the low-cost producers in given industries.

In short, the new wage approach is key to successful corporate restructuring. At this point, it seems to be one element in all the restructuring with a clear-cut payoff. □

PRICE & PRODUCTION DATA

(Effective March 3,1986)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
Northeast Coast	202	154	179	192
Pittsburgh	251	238	206	206
Youngstown	113	119	112	110
Lake Erie	163	162	130	159
Detroit	150	139	141	144
Chicago	521	505	509	442
Midwest	152	157	172	176
Southern	224	216	227	203
Western	92	92	87	95
U.S. Production	1,868	1,782	1,763	1,727

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower lake ports using 25-percent stock. Base prices, non-transportation, handling and unloading may be charged to buyer. Check for specifics.

Pellets (per iron unit natural)	gross-ton 58.0*
Pellets (per iron unit natural)	gross-ton 59.4**
Pellets (per iron unit natural)	gross-ton 72.5-86.9***
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53

*58.0¢—Mineral Services, Inc. as of 5-13-85. **59.4¢—Pickands Mather, 6-1-85 delivered head of vessel, upper Lake ports. ***72.5¢—Lease as of 8-15-85. 86.9¢—Ogrebay Norton 5-23-42. Hanna Mining and Cleveland Cliffs 2-24-87.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective March 3,1986)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1986	To Date 1985
Net tons, in thousands	1,868	1,782	15,087	13,625
Capability Utilization Rate	74.9	71.4	70.5	61.4

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢ lb.—eff. 1-1-85)	24.607	24.607	24.607	27.582
Pig Iron** (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.*** (Gross ton=2240 lbs.)	$ 73.50	$ 75.50	$ 75.50	$ 86.50
No. 2 bundles	$ 52.83	$ 53.83	$ 53.83	$ 57.50

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh	$ 73.50	$ 76.50	$ 76.50	$ 92.50
No. 1 steel, Philadelphia	72.50	72.50	72.50	81.50
No. 1 steel, Chicago	74.50	77.50	77.50	85.50
No. 1 bundles, Detroit	65.50	70.50	70.50	87.50
Low Phos., Youngstown	73.50	76.50	76.50	72.50
No. 1 mach'y cast, Pgh	73.50	68.50	68.50	71.50
No. 1 mach'y cast, Phila	93.50	93.50	92.50	98.50
No. 1 mach'y cast, Chi	109.50	109.50	109.50	111.50

*Finished Steel Composite—Weighted index based on steel shipments to seven market areas, with adjustments for freight differentials and product extras. Weighted composite represents typical cost of flat-rolled carbon steel sheets, strip, plates and hot-rolled bars delivered to consumers in Chicago, Detroit, Gulf Coast, Pittsburgh, Philadelphia, Cleveland and Youngstown areas. **Pig Iron—Average basic, foundry, Valley and Delivered Philadelphia prices. ***Scrap—Average No. 1 heavy melting and No. 1 bundles delivered to consumers in Pittsburgh, Philadelphia, Chicago and Detroit areas.

NONFERROUS PRICES

(Effective March 3,1986) Prices obtained in more usual or representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	year ago price	% change
Aluminum (LME)	51.69	50.44	3
Copper (C)	66.50-70.00	67.00-70.00	3
Lead	17.75-19.00	18.00-19.00	2
Magnesium Ingot	153.00	148.00	12
Nickel (LME)	187.42	182.18	3
Zinc	35.00	38.00	11

3.96	Platinum, per troy oz.	$390.00	
	Palladium, per troy oz.	$1,085.00	
	Silver, nigotts, per troy oz.	$5.505	
	Titanium sponge, mill grade	$3.40-3.55	
	Tungsten, powder, lvd red.	$9.50-9.85	
	Vanadium	$6.00	
	Zirconium sponge	$12.00-13.00	

Per lb. unless otherwise noted.

ALUMINUM: Avg. for last week 6 primary ingot, 2 DDRW, 2 scrap (LME) common grade. MAGNESIUM: 99.8% ingot, delivered. NICKEL: Avg. for last week 6 primary ingot, LME high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$236.00
Beryllium-copper, per lb. cont. Be	$144.00
Beryllium 97% powder 200	$197.00
Cadmium, ton lots	$1.25-1.50
Calcium, ton lots, crown	$3.92
Chromium, 99.5% electro	$4.62
Cobalt, 99% cathode	$11.70
Gold per troy oz.	$335.60
Indium, dollars per troy oz.	$2.50
Iridium, dollars per troy oz.	$430.00
Magnesium sticks, 10,000 lbs.	$2.02
Mercury, per 76-lb. f.o.b. N.Y.	$240.00-260.00
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$3.00-3.13
Palladium, per troy oz.	$107.00

Straits Tin Price

Dec. 24—375.59 Dec. 27—393.47
Dec. 25—367.14 Dec. 28—382.36
Dec. 26—392.12

Scrap Prices
Brass Mill Scrap

(Cents per lb. carload lots, del. to mill in Conn. Valley)

	Solids	Turnings
Copper	61	57
Yellow brass	51½	44
Red brass	56	47½
Comm. bronze	53½	46¼
Mang. bronze	43	37
Free cutting rod ends	48	47

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	59
No. 2 copper wire	52
Light copper	43

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	55
No. 2 copper wire	48
Light copper	39
No. 1 composition	46
No. 1 comp. turnings	45
Hvy. yellow brass solids	30
Hvy. yellow brass turnings	27
Radiators	35

Aluminum		
New mixed clips	38	— 39
Old sheet	36	— 37
Old cast	36	— 37
Clean dry borings	36	— 37

Dealers' Scrap

Dealers buying price f.o.b. New York in cents per pound

Aluminum

Segregated clippings	27	— 28
Mixed U.C. clips	23	— 25
Old sheets and cast	22	— 23
Borings and turnings	17	— 19
Duralumin clippings	25	— 26

Copper and Brass

No. 1 copper wire	46	— 47
No. 2 copper wire	39	— 40
Light copper	32	— 33
Radiators	31	— 32
No. 1 composition	39	— 41
No. 1 composition turnings	36	— 37
Cocks and faucets	29	— 30
Clean heavy yellow brass	27	— 28
Brass Pipe	28	— 29
New soft brass clippings	39	— 40

Lead

Heavy soft lead	5	— 7
Whole batteries	1	— 3
Type metal	15	— 17
Electrotype	13	— 14

Nickel

Nickel solids	110	—120
Nickel rod ends	110	—120
Nickel sheets, clips	110	—120
Nickel turnings	25	— 35

Zinc

New zinc clippings	15	— 16
Old diecast zinc	11	— 12

EFFECTIVE MARCH 3, 1986

Ferrous Scrap Prices

Pittsburgh

Chicago

Philadelphia

Detroit

Youngstown

Cleveland

Buffalo

St. Louis

Birmingham

Cincinnati

New York

Boston

San Francisco

Los Angeles

Seattle

Hamilton, Ont.

Houston

OIL PRICE DROP ROUTES INFLATION CONCERNS

The year got off to a good start on the price front. Prices of producer finished goods in January declined by 0.7 pct from the previous month.

Much of the drop, of course, was due to slumping energy goods prices. These went down a resounding 4.2 pct. That's an annual rate of about 50 pct.

Energy goods aside, January was a month of mixed price moves. This is seen in prices for various types of capital goods. Overall, capital equipment prices dipped 0.1 pct in January. Pulling downward were prices of light trucks, chemical industry machinery, and pumps and compressors. Pushing upward were prices for heavy trucks, machine tools, office machinery and construction machinery.

The energy price break came at a time when price analysts were starting to take a hard look at some rippling inflationary pressures. As the Labor Dept. noted: "The (price) index had risen considerably in each month of the last quarter of 1985."

The energy price drop, however, has cooled any concerns about inflation sneaking back onto the scene.

Most oil analysts say the low prices on that commodity will be on the scene for some time. Too, it is expected that the effects of the oil price drop will spread to other industries.

Prices in metalworking industries, as indicated on the table here, continued to hold the line. For example, of the 22 metalworking product lines listed, 18 of them in January had either actual month-to-month price declines, didn't change at all or rose less than 0.5 pct.

The only product showing a "stiff" price hike in January was heavy trucks. These tags rose by almost 3 pct, and were up almost 11 pct over the year. Notably, heavy trucks face relatively little import competition.

Latest Month Covered: January 1986

Products	Index Reading For Month (1967 = 100)	Pct Change From Previous Month	Pct Change From Year-Ago Month
Metal Cutting Machine Tools	396.9	+ 0.5	+ 1.7
Metal Forming Machine Tools	438.5	+ 0.3	+ 2.1
Agricultural Machinery & Equip.	338.6	+ 0.2	0
Construction Machinery & Equip.	365.0	+ 0.4	+ 0.8
Industrial Process Furnace & Ovens	395.2	+ 0.9	+ 3.4
Industrial Material Handling Equip.	295.5	— 0.2	+ 1.0
Pumps, Compressors & Allied Equip.	357.2	— 0.6	+ 1.0
Fluid Power Equip. (Dec. 1970 = 100)	265.7	0	+ 1.4
Mechanical Power Transmission Equip.	339.9	+ 0.3	+ 1.8
Automobiles	230.1	— 1.0	+ 1.3
Motor Trucks—Light	308.4	— 1.3	+ 4.9
Motor Trucks—Heavy	344.9	+ 2.9	+ 10.9
Railroad Equipment	364.5	0	+ 1.3
Fabricated Metal Structural Products	315.1	— 0.1	+ 0.5
Electric Motors	349.7	— 0.4	— 0.1
Valves & Fittings (Dec. 1982 = 100)	106.1	+ 0.8	+ 2.4
Ball & Roller Bearings	353.5	+ 0.1	+ 2.3
Cutting Tools & Accessories	288.6	+ 0.4	+ 1.4
Heating Equipment	264.6	+ 0.9	+ 3.2
Plumbing Fixtures & Brass Fittings	314.8	0	+ 2.7
Metal Containers	361.3	0	+ 1.1
Miscellaneous Metal Products	302.4	0	+ 0.2

Data based on U.S. Labor Dept.'s Producer Price Index